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(52) UK CL (Edition T )

A4F FFD FSCA

(56) Documents Cited

GB 2361863 A GB 2359984 A  
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(58) Field of Search

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Other: Online: WPI, EPODOC, PAJ

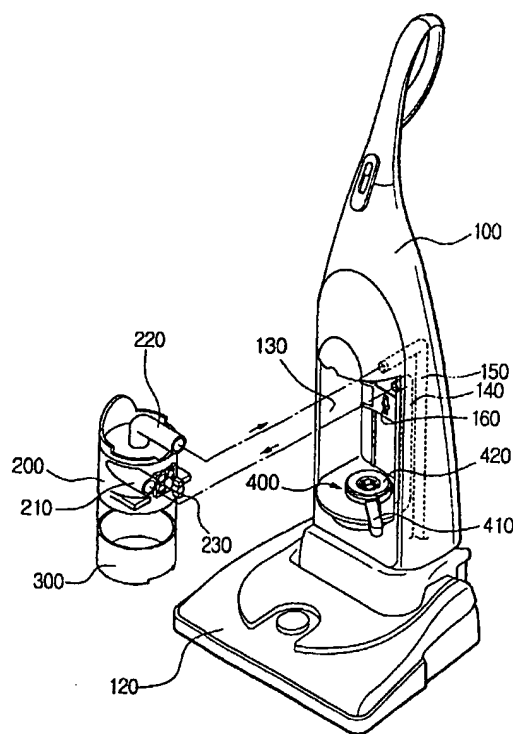
(54) Abstract Title

**Upright vacuum cleaner with removable cyclone and dirt bin**

(57) An upright vacuum cleaner has a body 100 in which is mounted a removable cyclone unit 200, having a dirt collecting bin 300 removably attached to its bottom end. The assembly is characterised in that the cyclone is mountable in place without using a screw driver, by means of a rotating member 230 with 'T' shaped head, which fits through a slot 160 in the vacuum cleaner body, and locks the cyclone in place by rotation through 90 degrees. As claimed the invention covers a number of alternative arrangements which do not resort to the use of a screw.

Also claimed is an upright vacuum cleaner of similar type characterised in that the dirt bin 300 is removably attached to the cyclone unit by means of a rotatable locking mechanism 400 having an operating handle 410. When the bin 300 is in place, rotation of the handle in the locking direction causes the plate 420 to rise up and force and hold the bin into contact with the bottom of the cyclone unit. To remove and empty the bin it is simply necessary to rotate the handle in the unlocking direction, whereupon the bin drops down and can be removed.

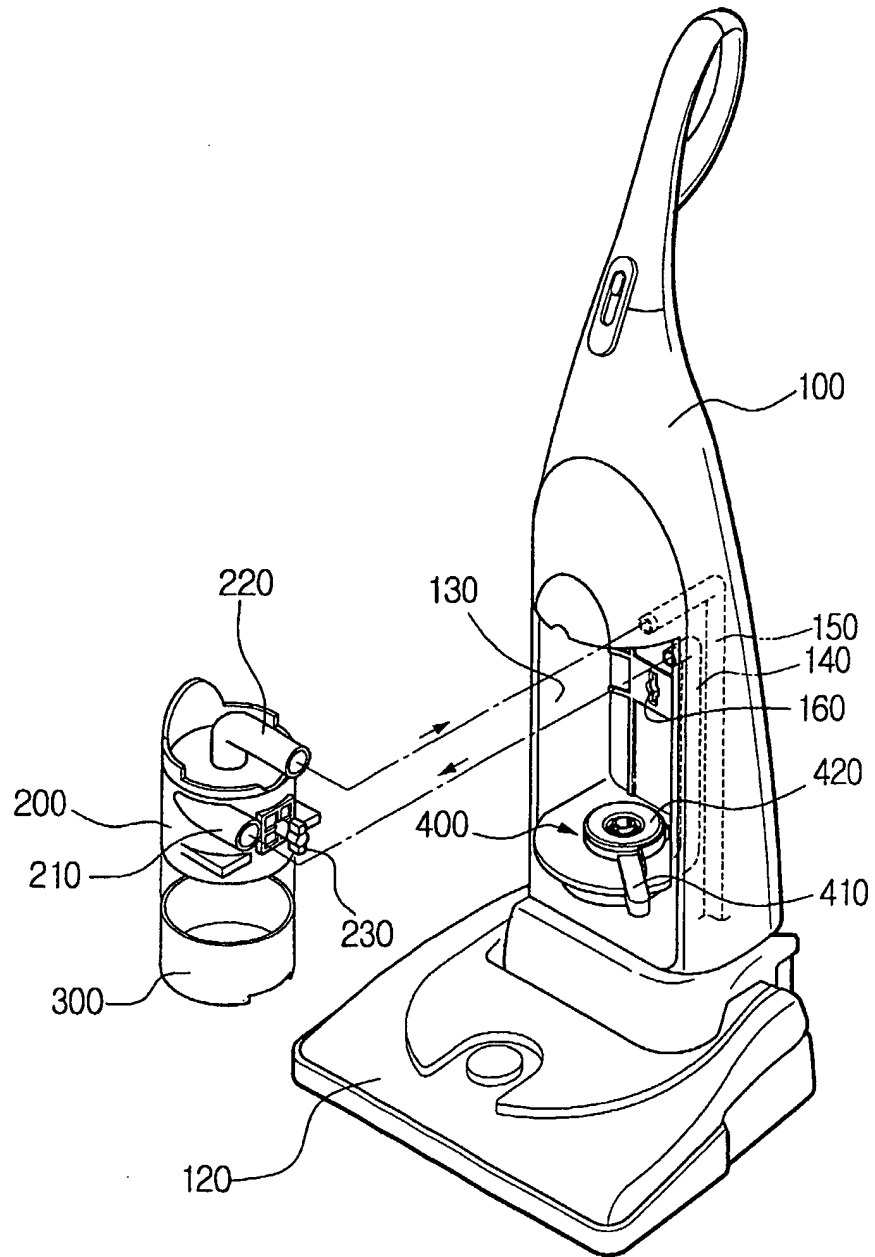
FIG. 1



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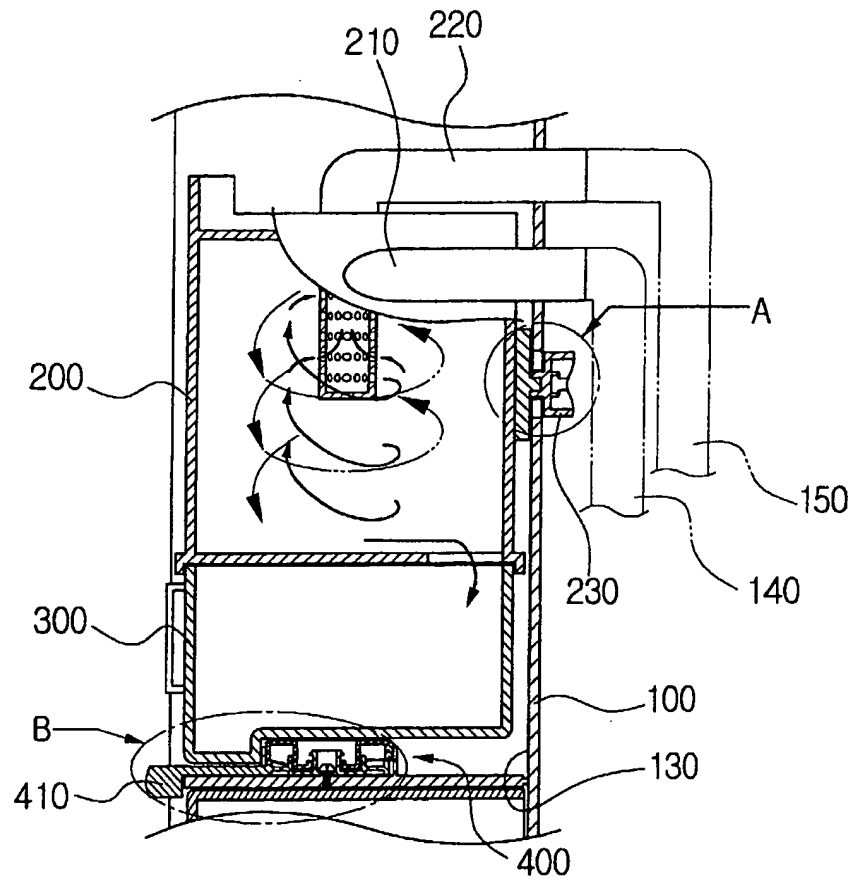
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FIG. 1



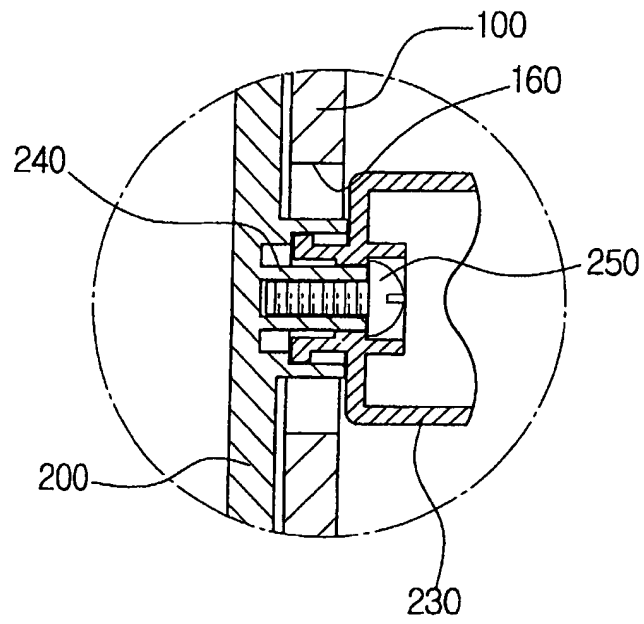
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FIG.2



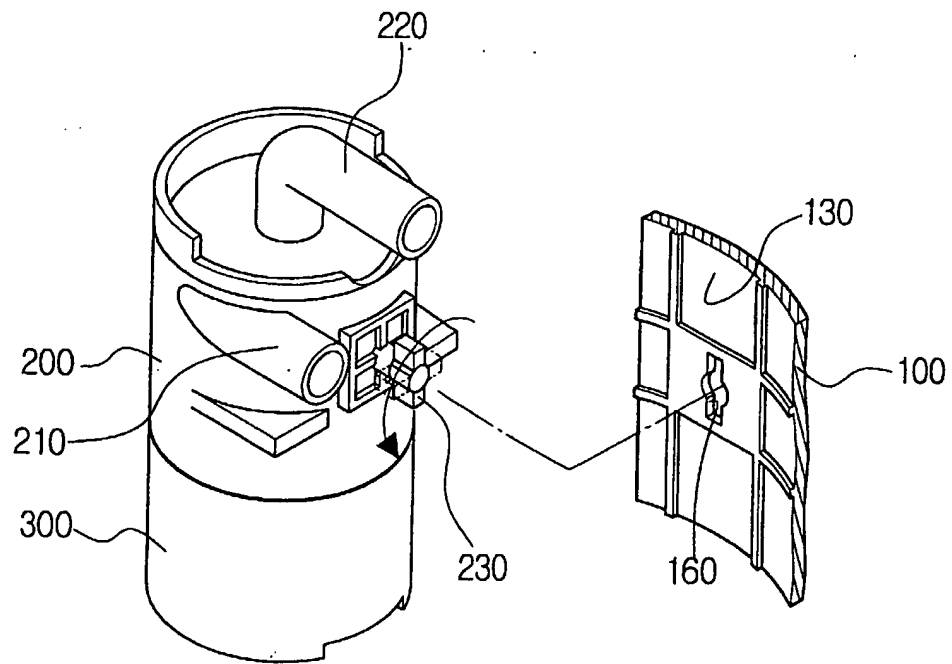
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FIG.3



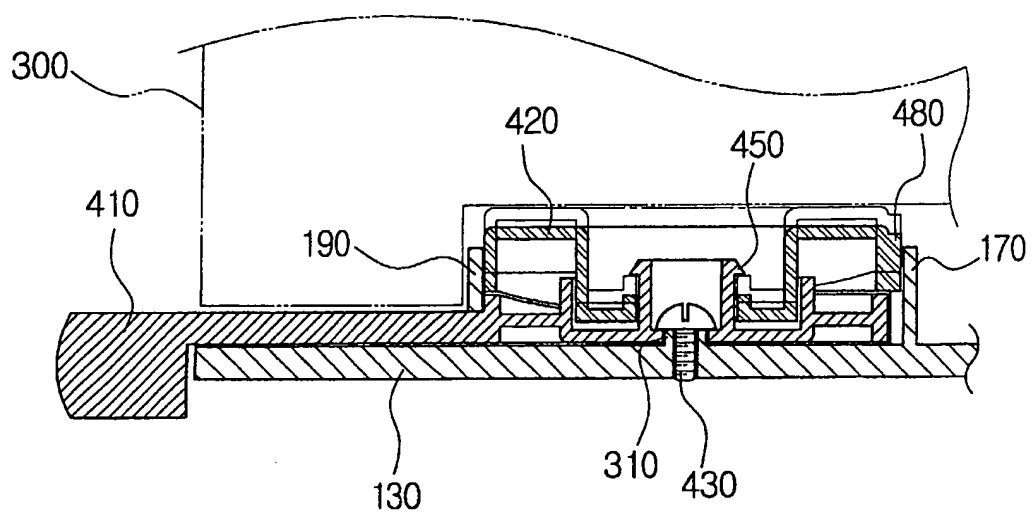
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FIG. 4



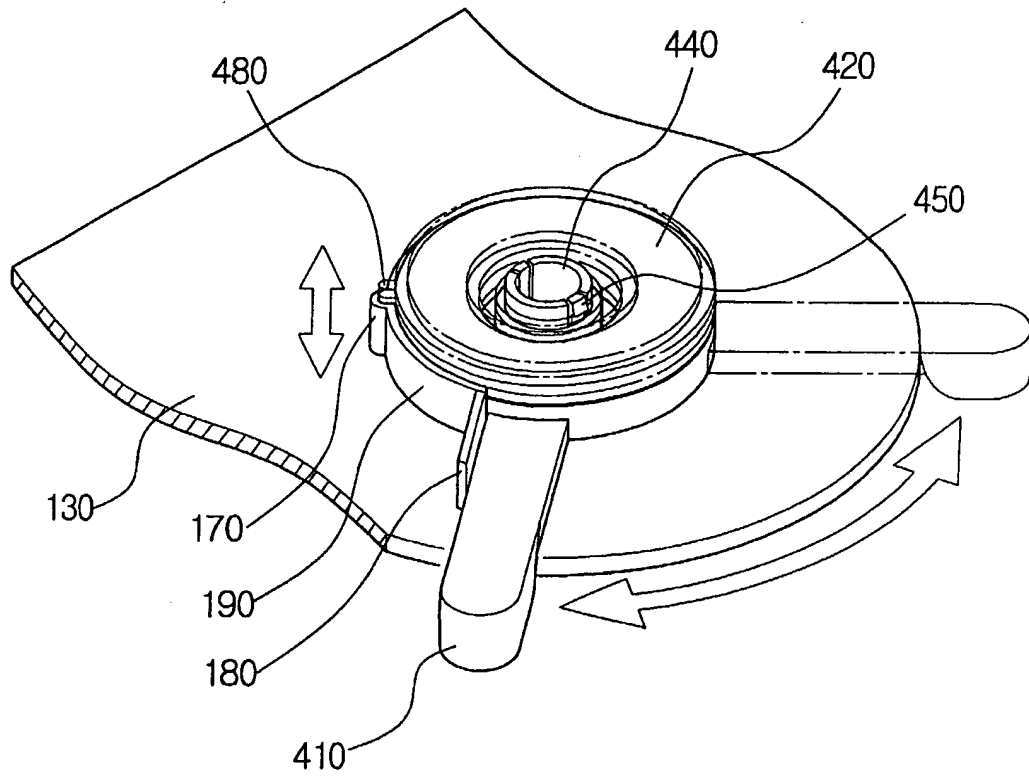
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FIG. 5



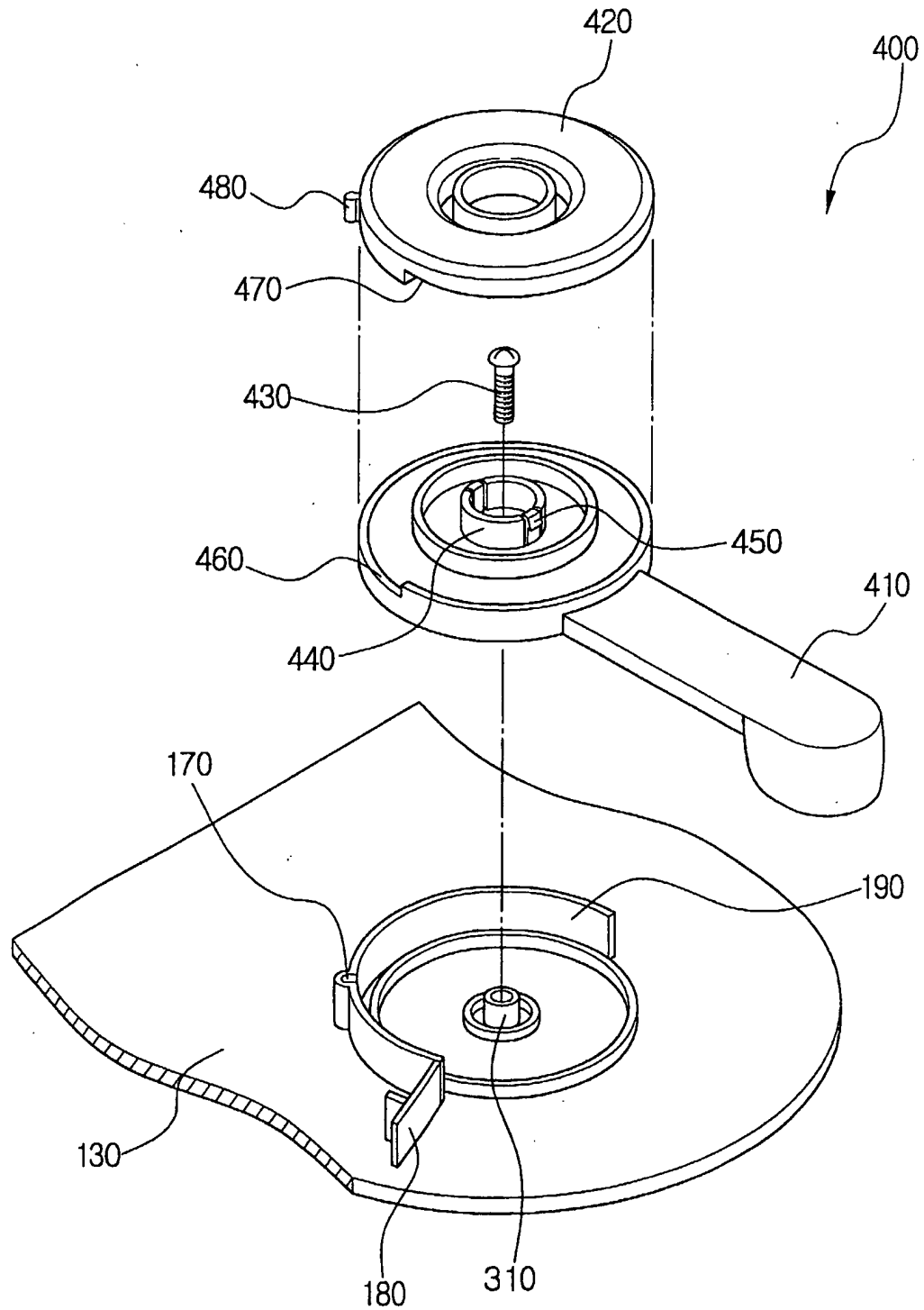
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FIG. 6



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FIG. 7





**UPRIGHT-TYPE VACUUM CLEANER****BACKGROUND OF THE INVENTION****1. Field of the Invention**

The present invention relates to an upright-type vacuum cleaner, and more particularly  
5 to an upright-type vacuum cleaner having a cyclone unit, which separates dust from an air  
current by a centrifugal force as drawn air forms a whirling air current.

**2. Description of the Related Art**

In an upright-type vacuum cleaner having a cyclone unit, a cyclone body for  
separating dust from a dust-laden air by a centrifugal force is generally formed in a dust-  
10 collecting chamber of a cleaner body. In addition, a dust-container for collecting the dust  
separated in the cyclone body by the centrifugal force is formed at a lower part of the cyclone  
body in the dust-collecting chamber.

However, a conventional upright-type vacuum cleaner with the above construction has  
some problems enumerated below.

15 Firstly, in the conventional upright-type vacuum cleaner, the cyclone body is  
connected with the cleaner body by a screw. Therefore, cleaning, repair, and maintenance of  
the vacuum cleaner is not easily done, and in some cases, the life span of the vacuum cleaner  
is shortened.

In other words, to connect the cyclone body with the cleaner body or to separate the  
20 cyclone body from the cleaner body, not only a separate tool is needed such as a driver but  
also a long time is spent to fasten or unfasten a screw.

In addition, to clean or repair the cyclone body, a user necessarily unscrews and  
screws the screw. If the number of unscrewing and screwing is increased, there is a possibility

of damaging a screw connection part of the cleaner body, and the user might not be able to use the vacuum cleaner.

Secondly, in the conventional upright-type vacuum cleaner, a sloping groove is formed at a lower side of the dust-container, and lever-type connection/separation means, which has a protrusion for elevating and lowering the dust-container by moving along the sloping groove, is disposed at a lower part of the dust-container. If the connection/separation means is rotated to the right or the left, the protrusion moves along the sloping groove, then the cyclone body is connected or separated with and from the cleaner body as the dust-container is elevated or lowered. To connect the dust-container with the cleaner body, or to separate the dust-container from the cleaner body, the user necessarily connects or separates the dust-container with and from the cyclone body, thus friction between the lower side of the dust-container and the connection/separation means is accompanied.

Moreover, the dust-container should be separated at any time from the cleaner body for removing collected dust. Therefore, if the vacuum cleaner is used for a long time, the sloping groove of the dust-container is scratched by the friction.

Although the scratches do not affect the function of the vacuum cleaner, considering that the dust-container is usually formed by injection molding with transparent material, it can damage the beauty of the vacuum cleaner. In other words, it can affect the reliability of the product.

## SUMMARY OF THE INVENTION

Accordingly, a first object of the present invention is to solve the first problem of the conventional upright-type vacuum cleaner and thus to provide an upright-type vacuum cleaner in which the cyclone body is connected and separated with and from the cleaner body

easily and quickly without using a separate tool such as a driver.

A second object of the present invention is to solve the second problem of the conventional upright-type vacuum cleaner and thus to provide an upright-type vacuum cleaner in which the dust-container is connected and separated with and from the cleaner  
5 body without causing any friction.

The first object of the present invention is accomplished by providing an upright-type vacuum cleaner comprising a cleaner body in which a suction brush is formed at a lower part, and a vacuum-generating device built therein, a cyclone unit for separating dust from the air drawn through a suction passage connected with the suction brush, and  
10 discharging the cleaned air through a discharging passage connected with the vacuum-generating device, and a dust-container, removably connected with a lower part of the cyclone unit, for collecting the separated dust by the cyclone unit, the cyclone unit has a locking handle, and a handle connection portion for connecting with the locking handle removably is formed at a corresponding place to the cleaner body. In the preferred embodiment of the  
15 present invention, the locking handle is composed of a rotating knob.

Moreover, the second object of the present invention is accomplished by providing an upright-type vacuum cleaner comprising a cleaner body in which a suction brush is formed at a lower part, and a vacuum-generating device built therein, a cyclone unit for separating dust from the air drawn through a suction passage connected with the suction brush, and  
20 discharging the cleaned air through a discharging passage connected with the vacuum-generating device, and a dust-container, removably connected with a lower part of the cyclone unit, for collecting the separated dust by the cyclone unit. The dust-container is settled by a locking unit that moves upwardly and downwardly.

In the preferred embodiment of the present invention, the locking unit includes an operating lever rotatably installed at the cleaner body, a locking disk that moves upwardly and downwardly in accordance with the rotation of the operating lever. The operating lever and the locking disk are operated with a camming motion.

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#### BRIEF DESCRIPTION OF THE DRAWINGS

The above mentioned objects and features of the present invention will be more apparent by describing the preferred embodiment of the present invention in detail by referring to the appended drawings, in which

10        FIG. 1 is an exploded perspective view showing an upright-type vacuum cleaner according to the present invention;

FIG. 2 is a sectional view showing a cyclone body and a dust-container mounted on a cleaner body of the upright-type vacuum cleaner according to the present invention;

FIG. 3 is a view showing an enlarged part "A" of FIG. 2;

15        FIG. 4 is an exploded perspective view showing a connection status of a locking handle and a handle connection portion of the upright-type vacuum cleaner according to the present invention;

FIG. 5 is a view showing an enlarged part "B" of FIG. 2;

20        FIG. 6 is a perspective view showing a locking unit of the upright-type vacuum cleaner according to the present invention; and

FIG. 7 is an exploded perspective view showing the locking unit of the upright-type vacuum cleaner according to the present invention.

#### DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

From now on, the preferred embodiment of the present invention will be described in great detail by referring the appended drawings.

FIGS. 1 and 2 illustrate one embodiment of an upright-type vacuum cleaner according to the present invention. The upright-type vacuum cleaner of the present invention includes a  
5 cleaner body 100, a cyclone unit 200, a dust-container 300, and a locking unit 400.

A vacuum-generating device (not shown) is disposed in the cleaner body 100. In addition, a suction brush 120 is disposed at a lower part of the cleaner body 100. A cyclone-embracing portion 130 is disposed at a front center of the cleaner body 100.

A suction passage 210 connected with the suction brush 120 is disposed at an upper  
10 part of the cyclone unit 200. Dust drawn through the suction brush 120 is drawn into the cyclone unit 200 through the suction passage 210. The suction passage 210 is disposed for the drawn air passed therethrough to be drawn in a tangential direction with respect to the cyclone unit 200. Therefore, the air drawn through the suction passage 210 forms a whirling air current along an inside wall of the cyclone unit 200.

15 A discharging passage 220, connected with the vacuum-generating device, is disposed at an upper center of the cyclone unit 200. The cleaned air in the cyclone body 200 is discharged outside of the cleaner body 100 through the vacuum-generating device and the discharging passage 220.

One end of a pair of tubes 140 and 150, which each of their other ends are connected  
20 with the vacuum-generating device and the suction brush 120, are disposed in an interior wall of the cyclone embracing portion 130. The tubes 140 and 150 are disposed for each end of the tubes face the front.

To correspond to the tubes 140 and 150, the suction passage 210 and the discharging

passage 220 of the cyclone unit 200 are disposed backward in parallel with each other. Thus, the suction passage 210 and the discharging passage 220 can be easily connected with the tubs 140 and 150, by a horizontal movement of the cyclone unit 200.

5 A locking handle 230 is disposed at an outer back of the cyclone unit 200. As shown in FIG. 3, a hinge shaft 240 is protruded from an outer side of the cyclone unit 200, and the locking handle 230 is rotatably connected with the hinge shaft 240 by a screw 250.

As shown in FIG.4, a handle connection portion 160 is formed at a corresponding place to the cleaner body 100, and if the locking handle 230 is passed through the handle connection portion 160 and rotated 90°, then the cyclone unit 200 is firmly mounted on the  
10 cleaner body 100.

As shown in FIGS. 5 and 6, the locking unit 400 is disposed at a front side of the cyclone-embracing portion 130, and as shown in FIG. 2, the dust-container 300 is removably mounted on a lower part of the cyclone unit 200 by the locking unit 400.

The locking unit 400 includes an operating lever 410 and a locking disk 420. As shown  
15 in FIGS. 6 and 7, the hinge shaft 310 is protruded from a lower side of the cyclone-embracing portion 130, and an operating lever 410 is rotatably connected with the hinge axis 310 by the screw 430.

Another hinge shaft 440, which has a cavity formed therein and protruded upwardly, is formed at a rotating center of the operating lever 410, and the locking disk 420 is connected  
20 with the hinge shaft 440 for moving upwardly and downwardly. In FIG. 7, the reference numeral 450 is a hook for preventing the separation of the locking disk 420.

A cam unit 460 is formed at an upper side of the operating lever 410, and other corresponding cam unit 470 is formed at a lower side of the locking disk 420. The locking

disk 420 moves up and down along the hinge shaft 440 by a reciprocal action of the two cam units 460 and 470.

A protrusion 480 is formed at one side of a circumference of the locking disk 420, and a guide portion 170, is formed at the lower side of the cyclone-embracing portion 130 for preventing the rotation of the locking disk 420 by being engaged with the protrusion 480. In FIG. 7, the undesignated reference numeral 180 is a stopper.

Accordingly, as shown in FIG. 6, if the user rotates the operating lever 410 to the left, locking is released as the locking disk 420 moves down. If the user rotates the operating lever 410 to the right, it is locked again as the locking disk 420 moves up again.

Meanwhile, in FIG. 7, the undesignated reference numeral 190 is a supporter that supports the lower side of the dust-container 300 and prevents the lower side of the dust-container 300 from being contacted with the locking unit 400 when the locking unit 400 is unlocked.

In an upright-type vacuum cleaner according to the present invention having the above construction, when the user wants to connect the cyclone unit 200 and the dust-container 300 with the cleaner body 100, the user firstly places the locking handle 230 as shown in FIG. 4.

The user inserts the suction passage 210, the discharging passage 220 and the locking handle of the cyclone unit 200 into the pair of tubes 140 and 150 and handle connection portion 160, and rotates the locking handle 230 for 90°, as shown in FIG. 4.

As described, the cyclone unit 200 is firmly connected with the cyclone-embracing portion 130 of the cleaner body 100. Thus, the user does not need a separate tool or a part to mount the cyclone unit 200 on the cleaner body 100.

Then, as shown in FIG. 6, the user rotates the operating lever 410 to the left, and

pushes the dust-container 300 into the cyclone-embracing portion 130 of the cleaner body 100, then rotates the operating lever 410 to the right.

Accordingly, the locking disk 420 moves upwardly by a reciprocal action of the pair of cam units 460 and 470, and the dust-container 300 is connected with the lower side of the cyclone unit 200.

On the other hand, when the user wants to empty the dust-container 300, the user rotates the operating lever 410 to the left, as shown in FIG. 6. Then the locking disk 420 becomes unlocked.

In other words, the locking disk 420 moves downwardly along the hinge shaft 410 by the reciprocal action between the cam unit 460 of the operating lever 410 and the cam unit 470 of the locking disk 420, and by the weight of the dust-container 300.

Therefore, the user can pull out the dust-container 300 and empty it. Thus, the bottom of the dust-container 300 can be prevented from being damaged because the user can connect and separate the dust-container 300 with and from the cleaner body 100 without causing any friction.

In addition, when the user needs to separate the cyclone unit 200 from the cleaner body 100 for cleaning or repair, the user firstly removes the dust-container 300, and then places the locking handle 230 as shown in FIG. 4.

In this status, if the user pulls out the cyclone body, the cyclone unit 200 is separated from the cleaner body 100. Therefore, a separate tool or a part is not needed to separate the cyclone unit 200 from the cleaner body 100.

Consequently, according to the upright-type vacuum cleaner of the present invention described so far, there is an advantage that the cyclone unit 200 can be easily and promptly



connected and separated with and from the cleaner body 100 without a use of a tool or a part.

Moreover, according to the upright-type vacuum cleaner of the present invention described so far, the user can connect and separate the dust-container 300 with and from the cleaner body 100 without causing any friction, thus the bottom of the dust-container 300 can  
5 be prevented from being damaged.

So far, the preferred embodiment of the present invention has been illustrated and described. However, the present invention is not limited to the preferred embodiment described here, and someone skilled in the art can modify the present invention without distorting the point of the present invention as claimed.

10

## CLAIMS

1. An upright-type vacuum cleaner, comprising:

a cleaner body having a suction brush formed at a lower part, and a vacuum-generating device built therein;

5 a cyclone unit for separating dust from air drawn through a suction passage connected with the suction brush, and discharging a cleaned air through a discharging passage connected with the vacuum-generating device; and

a dust-container removably connected with a lower part of the cyclone unit, for collecting the dust separated by the cyclone unit,

10 the cyclone unit having a locking handle, and a handle connection portion for connecting with the locking handle being removably formed at a corresponding place to the cleaner body.

2. The upright-type vacuum cleaner of claim 1, wherein the locking handle is a  
15 rotating knob.

3. The upright-type vacuum cleaner of claim 1, wherein the dust-container is secured by a locking unit that moves upwardly and downwardly.

20 4. The upright-type vacuum cleaner of claim 3, wherein the locking unit includes an operating lever rotatably installed at the cleaner body, and a locking disk that moves upwardly and downwardly in accordance with the rotation of the operating lever.

5. The upright-type vacuum cleaner of claim 4, wherein the operating lever and the locking disk are operated in a camming motion.

6. An upright-type vacuum cleaner, comprising;

5 a cleaner body having a suction brush formed at a lower part, and a vacuum-generating device built therein;

a cyclone unit for separating dust from air drawn through a suction passage connected with the suction brush, and discharging a cleaned air through a discharging passage connected with the vacuum-generating device; and

10 a dust-container removably connected with a lower part of the cyclone unit, for collecting the dust separated by the cyclone unit,

the dust-container being secured by a locking unit that moves upwardly and downwardly.

15 7. The upright-type vacuum cleaner of claim 6, wherein the locking unit includes an operating lever rotatably installed at the cleaner body, and a locking disk that moves upwardly and downwardly in accordance with the rotation of the operating lever.

8. The upright-type vacuum cleaner of claim 7, wherein the operating  
20 lever and the locking disk are operated in a camming motion.

9. An upright-type vacuum cleaner substantially as described herein with reference to the accompanying drawings.



INVESTOR IN PEOPLE

Application No: GB 0127996.7  
Claims searched: 1-5

Examiner: John Wilson  
Date of search: 28 January 2002

## Patents Act 1977 Search Report under Section 17

### Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.T): A4F[FFD]; B2P

Int Cl (Ed.7): A47L 9/16;

Other: Online:- WPI, EPODOC, PAJ

### Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
A	GB 2361863 A Hoover	
A	GB 2359984 A Hoover	
X,Y	GB 2321181 A Electrolux AB - note p.7 ll.13-24, p.11 ll.8-18, figs.	1
Y	EP 0928594 A1 Royal Appliance - note col.7 l.20 et seq	1

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
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